AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-2. (cancelled)

3. (currently amended) An illumination device comprising:

a light source;

an optical fiber bundle ~~waveguide~~;

a coupling-in optical system which couples the light of said light source into a first end of said fiber bundle ~~waveguide~~, wherein the coupling-in optical system having a large numerical entrance aperture;

a coupling-out optical system which couples out the light emerging from a second end of said optical fiber bundle ~~waveguide~~;

an illuminating optical system which ~~receives the light emerging from said coupling-out optical system and~~ illuminates an image field; and

~~an optical fiber bundle which is arranged as said optical waveguide; and~~

a homogenizing optical system which is arranged between said coupling-out optical system and said illuminating optical system, wherein said homogenizing optical system homogenizes the nonuniform intensity distribution in the image field of the light emerging from said optical fiber bundle, and wherein homogenization occurs in an intermediate image plane that is outside of an object, and is performed only by the homogenizing optical system.

~~wherein the light of said light source is picked off via said couplingin optical system having a large numerical entrance aperture and is coupled into said optical fiber bundle.~~

4. (currently amended) An illumination device comprising:

a light source;

an optical fiber bundle ~~waveguide~~;

a coupling-in optical system which couples the light of said light source into a first end of said fiber bundle ~~waveguide~~, wherein the coupling-in optical system having a large numerical entrance aperture NA that is greater than or equal to 0.60;

a coupling-out optical system which couples out the light emerging from a second end of said optical fiber bundle ~~waveguide~~;

an illuminating optical system which ~~receives the light emerging from said coupling-out optical system and~~ illuminates an image field; and

~~an optical fiber bundle which is arranged as said optical waveguide; and~~

a homogenizing optical system which is arranged between said coupling-out optical system and said illuminating optical system, wherein said homogenizing optical system homogenizes the nonuniform intensity distribution in the image field of the light emerging from said optical fiber bundle, and wherein homogenization occurs in an intermediate image plane that is outside of an object, and is performed only by the homogenizing optical system.

~~wherein the light of said light source is picked off via said coupling in optical system having a large numerical entrance aperture NA >= 0.60 and is coupled into said optical fiber bundle.~~

5-6. (cancelled)

7. (currently amended) A coordinate measuring instrument comprising:

a horizontally X-Y displaceable measurement stage for receiving a substrate with a feature that is to be measured;

an illumination system ~~with~~ including

a light source,

an optical fiber bundle, ~~waveguide,~~

a coupling-in optical system before the optical fiber bundle, ~~waveguide,~~

a coupling-out optical system after the optical fiber bundle, ~~waveguide, and~~

an illuminating optical system for illuminating an image field, and ~~field;~~

a homogenizing optical system which is arranged between said coupling-out optical system and said illuminating optical system, said homogenizing optical system homogenizes the non-uniform intensity distribution in the image field of the light emerging from the optical fiber bundle, wherein the light of said light source is picked off via said coupling-in optical system with a large numerical entrance aperture, and is coupled into said optical fiber bundle; and

a detector device for determining the values of X and Y coordinates ~~position~~ of the feature within the X-Y displaceable measurement stage. ~~feature;~~

~~an optical fiber bundle which is arranged as said optical waveguide; and~~

~~a homogenizing optical system which is arranged between said coupling-out optical system and said illuminating optical system, said homogenizing optical system homogenizes the nonuniform intensity distribution in the image field of the light emerging from the optical fiber bundle,~~

~~wherein the light of said light source is picked off via said coupling-in optical system with a large numerical entrance aperture, and is coupled into said optical fiber bundle.~~

8. (currently amended) A coordinate measuring instrument comprising:

a horizontally X-Y displaceable measurement stage for receiving a substrate with a feature that is to be measured;

an illumination system ~~with~~ including

a light source,

an optical fiber bundle ~~waveguide~~,

a coupling-in optical system before the optical fiber bundle ~~waveguide~~,

a coupling-out optical system after the optical fiber bundle ~~waveguide~~, ~~and~~

an illuminating optical system for illuminating an image field, and ~~field;~~

a homogenizing optical system which is arranged between said coupling-out optical system and said illuminating optical system, said homogenizing optical system homogenizes the nonuniform intensity distribution in the image field of the light emerging from the optical fiber bundle, wherein the light of said light source is picked off via said coupling-in optical system with a large numerical entrance aperture NA that is greater than or equal to 0.60, and is coupled into said optical fiber bundle; and

a detector device for determining the values of X and Y coordinates ~~position~~ of the feature within the X-Y displaceable measurement stage. ~~feature;~~

~~an optical fiber bundle which is arranged as said optical waveguide; and~~

~~a homogenizing optical system which is arranged between said coupling-out optical system and said illuminating optical system, said homogenizing optical system~~

~~homogenizes the nonuniform intensity distribution in the image field of the light emerging from the optical fiber bundle,~~

~~wherein the light of said light source is picked off via said coupling in optical system with a large numerical entrance aperture NA >_ 0.60, and is coupled into said optical fiber bundle.~~

9. (new) The coordinate measuring instrument of claim 8, wherein the feature is an edge.

10. (new) The coordinate measuring instrument of claim 7, wherein the feature is an edge.